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(56) Documents Cited

GB 2244985 A GB 2206337 A GB 1014108 A

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(54) Shive

(57) A shive for sealing the shive hole of a barrel or cask comprises an inner body with an outer annular wall 10 which can flex inwardly when the shive is driven into the shive hole and an outer sleeve 30 formed of a resilient plastics material which is softer than that of which the inner body is formed.

The inner body may have radially spaced outer and inner annular walls 10, 12 interconnected by radially extending webs 14, grooves (26, Fig 4) on its outer annular wall 10, a top flange 16 with undercut rim 18 and a lip (50, Fig 8) for retaining of the sleeve 30. The inner wall 12 may define a passage for fining and tapping which is closed by an integral diaphragm 22. The inner body may also have shallow axial grooves (62, Fig 9) with rough lands (64 Fig 9) to allow gas to escape from the barrel under pressure. The sleeve 30 may be moulded to the inner body, and may be of ethylene-vinyl acetate copolymers or elastomeric polymers and the inner body of low or high density polyethylene or polypropylene.

A peg 25 prevents the diaphragm on removal lying against the side wall of the passage.

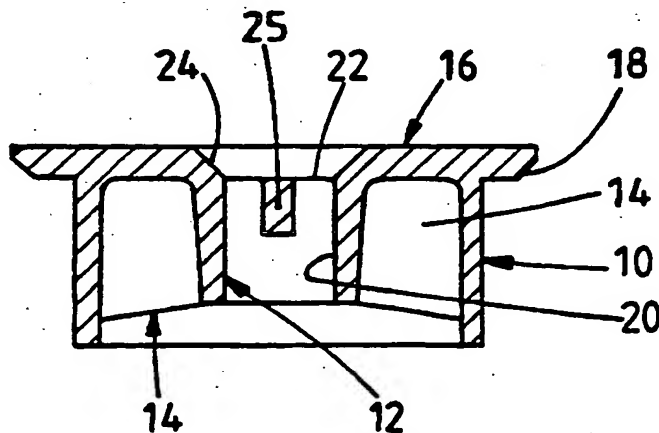


FIG. 1.

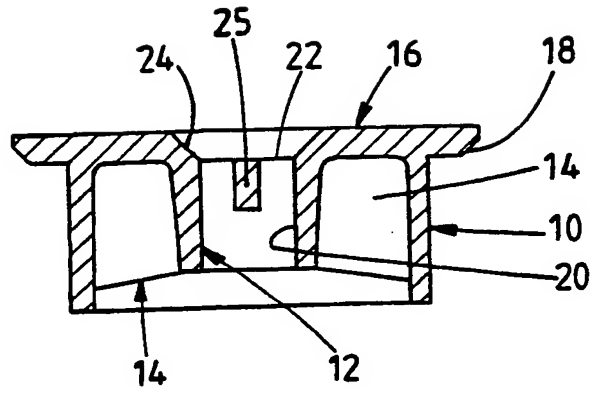


FIG. 1.

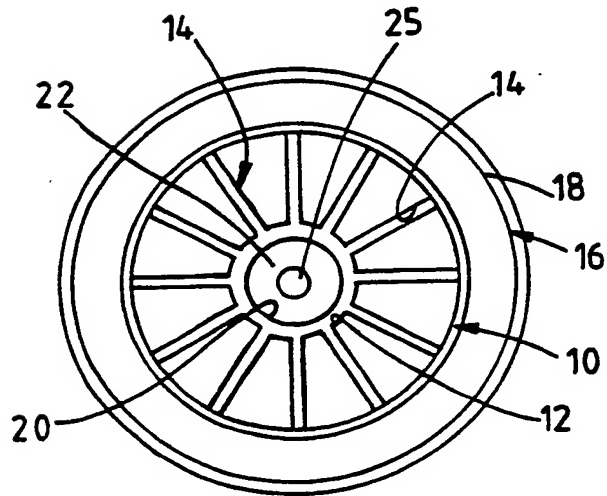


FIG. 2.

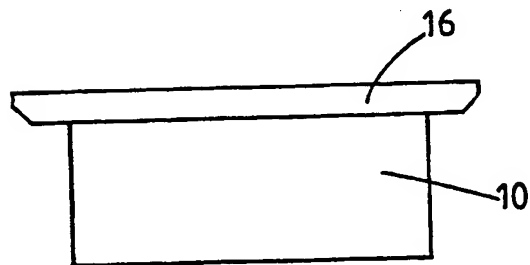


FIG. 3.

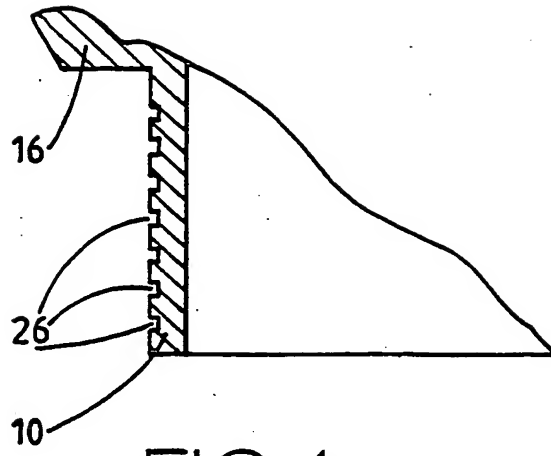


FIG. 4.

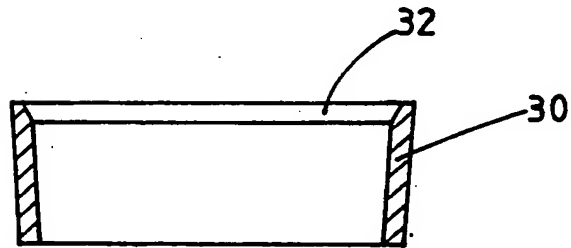


FIG. 5.

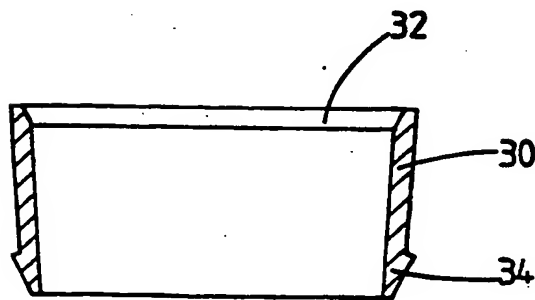


FIG. 6.

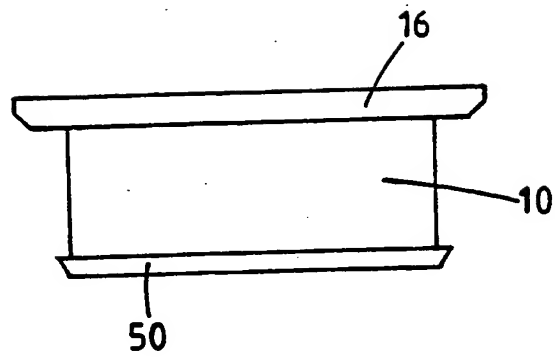


FIG. 7.

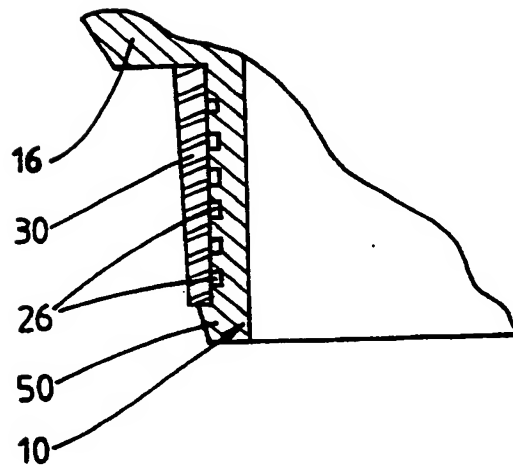


FIG. 8.

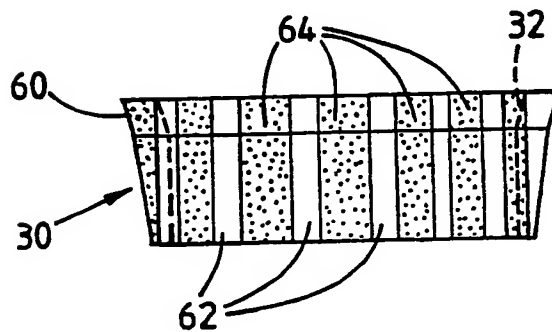


FIG. 9.

SHIVE

This invention relates to a shive (bung) used in the brewing industry for sealing the shive hole (ie the large hole in the side) of a barrel or cask.

Shives are traditionally made of wood and therefore have to absorb liquid and swell before making an effective seal. Such shives are not particularly effective at sealing shive holes which have become damaged or stretched.

It is an object of the present invention to provide an improved shive which can enable the above problems of traditional wooden shives to be obviated or mitigated.

According to the present invention, there is provided a shive comprising (a) an outer sleeve having an outer surface which is adapted to be a sealing fit with a shive hole, and (b) an inner body which is adapted to be a sealing fit within the outer sleeve, wherein the sleeve is formed of a resilient plastics material which is softer than that of which the inner body is formed, and wherein the inner body has a sleeve-engagable outer annular wall which can flex inwardly when the shive is driven into the shive hole in use.

Preferably, the inner body has an inner annular wall defining a fining/tapping passage in the shive, the inner annular wall being spaced inwardly of the outer annular wall and connected thereto by webs which are capable of flexing upon radial compression of the outer annular wall.

Most preferably, the inner body has a top flange which is

adapted to engage against the side of the cask or barrel around the shive hole in use. The top flange preferably has an undercut rim to facilitate automated removal, eg by a claw extractor.

Most preferably also, the outer annular wall has at least one groove, and preferably a multiplicity of grooves, in its outer surface, the groove(s) serving to receive material forced therein from the softer outer sleeve upon force fitting of the shive into the shive hole in use, whereby to improve the seal between the outer sleeve and the inner body.

An embodiment of the present invention will now be described, by way of example, with reference to the accompanying drawings, in which:-

Fig. 1 is an axial section through an inner body forming one part of a two-part shive according to one example of the present invention,

Fig. 2 is an underneath plan view of the inner body of Figure 1,

Fig. 3 is a side elevation of the body of Figs 1 and 2,

Fig. 4 is a scrap view showing part of the body of Figs 1 to 3 in greater detail,

Fig. 5 is an axial section through an outer sleeve forming the other part of the shive,

Fig. 6 is an axial section through an alternative form of outer sleeve,

Figs 7 and 8 are views based in Figs 3 and 4 showing a modification, and

Fig. 9 is a side view of a further modification of outer sleeve.

Referring to Figs 1 to 4, the inner body is of unitary construction and is moulded out of a plastics material (eg linear low density polyethylene, low or high density polyethylene or polypropylene) which is relatively rigid

in compression but which is sufficiently tough and resilient to withstand a heavy mallet blow. The inner body comprises radially spaced outer and inner annular walls 10 and 12 respectively, a multiplicity of radially extending webs 14 interconnecting the walls 10 and 12, and a circular top flange 16 having an undercut peripheral rim 18 to facilitate automated extraction when required. The inner wall 12 defines a passage 20 for "fining" and "tapping" which is closed by an integral diaphragm 22 separating the passage 20 from a hole 24 in the top flange 16. The hole 24 has an inwardly tapered side wall to facilitate guidance of the tube of a "fining" machine and/or a "tapping" peg. The location of the diaphragm 22 at the flange end of the passage 20 reduces the amount of dirt and water which can collect prior to "tapping". The diaphragm 22 is moulded with an elongate central peg 25 which ensures that the diaphragm 22 is completely removed upon tapping by preventing the latter from being torn away on one side only and lying against the side wall of the passage 20. Such an event would impair sealing.

As shown in Fig 4, the outer surface of the outer annular wall 10 has a multiplicity of peripheral grooves 26 therein. For convenience, these grooves 26 are not illustrated in Figs 1 and 3. In this embodiment, there are seven peripheral grooves 26, each having a width of 1.0 mm and a depth of 0.5 mm. The grooves 26 are each spaced 1.5 mm apart in the axial direction of the wall 10.

The other part of the shive is illustrated in Figure 5 and comprises an outer sleeve 30 formed of a plastics material which is softer than that of the inner body, being soft enough to form a seal but sufficiently tough and resilient not to split during insertion, use and extraction. Suitable plastics materials are considered

to be ethylene-vinyl acetate copolymers and elastomeric polymers, eg those sold under the Registered Trade Mark EVOPRENE. The outer sleeve 30 tapers inwardly from its outer end by an angle of  $15^{\circ}$  with respect to the longitudinal axis of the sleeve 30. The outer or top end of the sleeve 30 is flared at 32 to facilitate insertion of the inner body of Figs 1 to 4 therein.

In use, the inner body of Figs 1 to 4 is fitted into the outer sleeve 30 of Figure 5 and the resultant shive is driven by a heavy mallet into the shive hole of a barrel or cask. The outer diameter of the sleeve 30 is an interference fit with the peripheral wall of the shive hole so that, as the assembled shive is driven therein, the sleeve 30 is compressed inwardly so that portions thereof enter the grooves 26 in the inner body and thereby effect an efficient seal therewith in the manner of a multiplicity of O-ring seals. The taper angle on the sleeve 30 ensures that excess material thereof is squeezed upwardly rather than downwardly. The action of hammering the shive into the shive hole also exerts an inward compression force on the outer wall 10 of the inner body. This force can be absorbed by the webs 14 which are capable of flexing under compression whilst having sufficient structural rigidity to ensure that the outer wall 10 does not collapse.

The above-described shive (a) enables an immediate and effective seal upon insertion into the shive hole, (b) can seal damaged and/or stretched shive holes, (c) is easy to insert and withdraw without damage or stretching of the shive hole, (d) is ideally suited for insertion and withdrawal using automated machinery, and (e) after use can be re-used as scrap plastic.

In the embodiment of Fig 6, sleeve 30 has an outwardly extending annular lip 34 at its inner end. On insertion



into the shive hole, this lip 34 first flexes inwardly and then, when the shive is driven fully in, clips onto the inside of the cask thereby increasing the grip of the sleeve 30 in the cask or barrel. This is particularly suitable for highly conditioned beers where internal cask pressures are greater.

Referring now to Figs 7 and 8, the outer annular wall 10 has at its lower end an outwardly extending retaining lip 50 which is integrally formed with the annular wall 10 and which, when the inner body is assembled into the outer sleeve 30, clips under the latter to prevent separation of the two parts of the shive upon extraction from the cask.

Referring now to Fig. 9, the outer sleeve 30 illustrated therein is similar to that of Fig. 5 except that, in addition to the flare 32 to facilitate insertion of the inner body therein, the sleeve 30 is slightly flared also at its larger diameter (i.e, outer) end 60 on its outer periphery. In this embodiment, the outer periphery of the sleeve 30 has a series of very shallow axial grooves 62 alternating with axial lands 64 having a "grained" or otherwise rough surface. The grooves 62 enable release of gas/air pressure which builds up during insertion of the shive into the cask in order to prevent the shive from bouncing out when hit. This problem is most likely to occur with casks having correctly machined, undamaged shive holes. The provision of the lands 64 with rough surface serves to improve adhesion between the shive and the wall of the shive hole in the cask.

In a further modification (not shown) the outer sleeve is in situ moulded around the inner body of the shive. This can be done by loading the pre-formed shive inner body into an outer sleeve mould and then moulding the outer sleeve onto the inner body. This presents no

problem because the sleeve, being of softer material than the inner body, has a lower melting point so that the sleeve can be moulded without risk of unacceptable damage to the inner body.

CLAIMS

1. A shive comprising (a) an outer sleeve having an outer surface which is adapted to be a sealing fit with a shive hole, and (b) an inner body which is adapted to be a sealing fit within the outer sleeve, wherein the sleeve is formed of a resilient plastics material which is softer than that of which the inner body is formed, and wherein the inner body has a sleeve-engageable outer annular wall which can flex inwardly when the shive is driven into the shive hole in use.
2. A shive as claimed in claim 1, wherein the inner body has an inner annular wall defining a fining/tapping passage in the shive, the inner annular wall being spaced inwardly of the outer annular wall and connected thereto by webs which are capable of flexing upon radial compression of the outer annular wall.
3. A shive as claimed in claim 1 or 2, wherein the inner body has a top flange which is adapted to engage against the side of the cask or barrel around the shive hole in use.
4. A shive as claimed in claim 3, wherein the top flange has an undercut rim.
5. A shive as claimed in any preceding claim, wherein the outer annular wall has at least one groove in its outer surface, said at least one groove serving to receive material forced therein from the softer outer sleeve upon force fitting of the shive into the shive hole in use, whereby to improve the seal between the outer sleeve and the inner body.
6. A shive as claimed in any preceding claim, wherein the outer sleeve has at least one axial groove in its

outer periphery.

7. A shive as claimed in any preceding claim, wherein the outer sleeve has a rough outer surface which engages a wall of the shive hole in use.

8. A shive as claimed in any preceding claim, wherein the outer sleeve is in situ moulded around the inner body.

9. A shive substantially as hereinbefore described with reference to Figs 1 to 5, or Fig. 6 or Figs 7 and 8 of the accompanying drawings.

**Patents Act 1977**  
**Examiner's report to the Comptroller under**  
**Section 17 (The Search Report)**

Application number

GB 9313157.1

**Relevant Technical fields**

(i) UK CI (Edition L ) B8T (TAR, TAX, TBB, TMA, TPM)

(ii) Int CI (Edition 5 ) B65D 39/00 39/04

**Search Examiner**

DAVID MARSH

**Databases (see over)**

(i) UK Patent Office

(ii) ONLINE DATABASES: EDOC

**Date of Search**

27 JULY 1993

Documents considered relevant following a search in respect of claims 1 TO 9

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
X	GB 2244985 A (UB PLASTICS) Figures 1 and 2, page 3 lines 9-33	1,5,7
X, Y	GB 2206337 A (UB PLASTICS) Figures 1 and 2 page 4 line 27 to page 5 line 30	X: 1 Y: 2,3,5
Y	GB 1014108 (COOTE AND MCG) column 2 pages 52-53, Figure 10	

Category	Identity of document and relevant passages - 10 -	Relevant to claim.

### Categories of documents

**X:** Document indicating lack of novelty or of inventive step.

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